

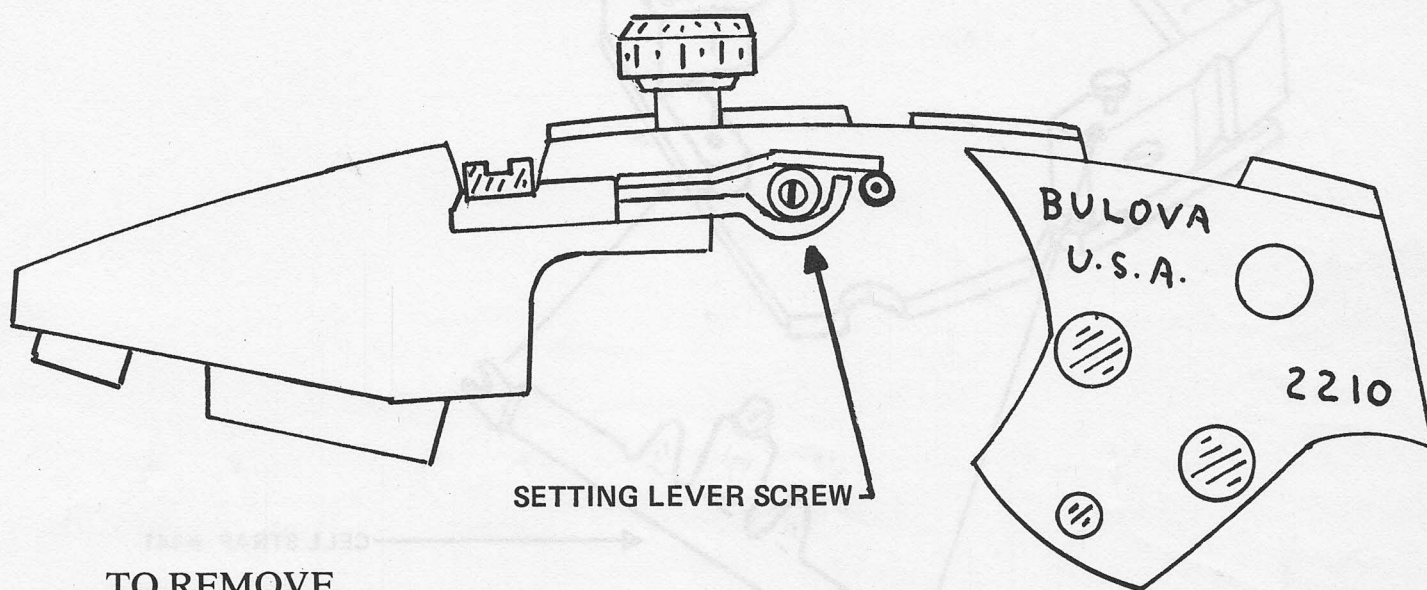
ACCUTRON® — SERIES 221

REPLACING THE STEM (Part # 176)

IMPORTANT:

The Setting Lever Screw is located between the spring arms of the electrical disconnect switch. In order not to distort these springs, it is important to use a well-formed screwdriver blade .60 mm in width.

The pawl bridge assembly has a circular cutout allowing for easy access to the screw head. Care must be taken not to inadvertently alter the location of this assembly.



TO REMOVE

1. Pull the stem to the "setting position" to assist in removal and replacement.
2. Unscrew the setting lever screw two to three full turns.
3. Keeping pressure on the screwdriver, gently ease the stem out.

TO REPLACE

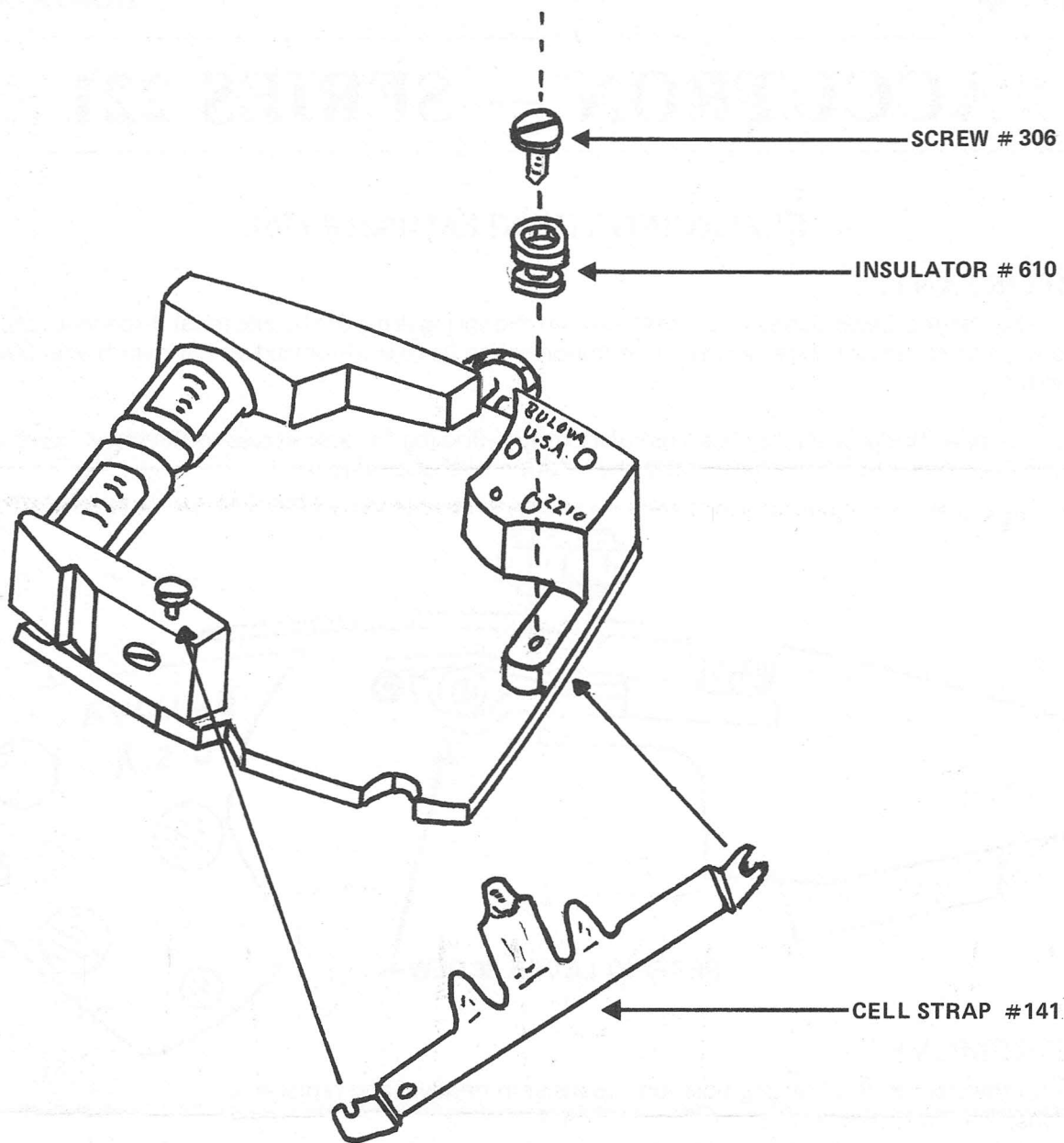
1. Press in the screw slot with screwdriver and ease the stem in to place, rotating so as to properly engage the setting pinion.
2. Tighten the setting lever screw. Check for correct operation.

Important: If the screw head has been damaged, make sure that there are no metal slivers touching the switch springs, causing a short circuit.

WHEN REPLACING THE CROWN

1. Use a chuck-type pin vise to hold the stem on the bearing surface, not by the square.
2. Tighten the crown using normal watchmaker care, so as not to twist or bend the stem.

Important: The dust cover of the crown should be in light contact with the bezel. The crown should never be jammed up against the case, nor so far from it that there is a visible separation of the bezel and the dust cover.



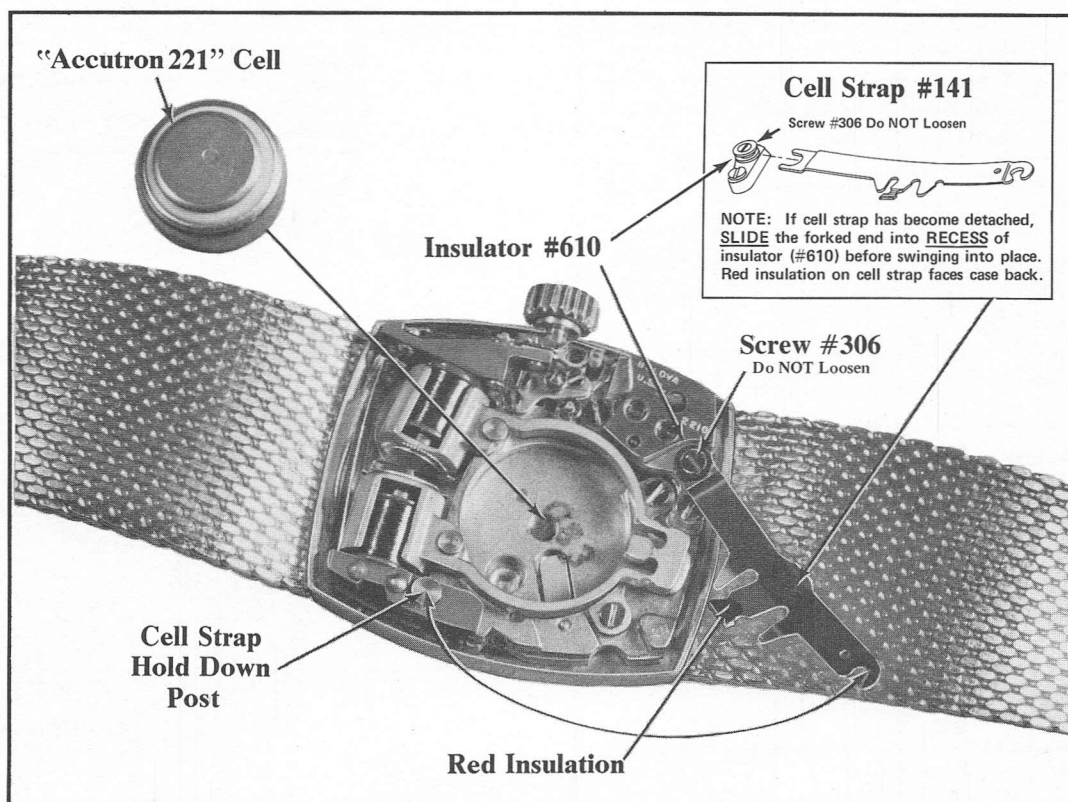
Correct replacement of the Power Cell does not require loosening Screw # 306. The Cell Strap # 141 should be rotated out of position as outlined in Technical Letter # 19.

Should a movement be brought in for repair, missing the Cell Strap # 141, the Insulator # 610, or Screw # 306, these parts may be purchased through your local Authorized Bulova Material Distributor.

ACCUTRON® — SERIES 221

REPLACING THE POWER CELL

1. Clean and wipe away any accumulated material from exterior of case (to prevent dirt from entering movement when case is opened).
2. Open the case. Apply a case knife at the groove provided. For water-resistant models, use a suitable case wrench.
3. **Remove movement from the case back and place in bezel.** This is not necessary on water-resistant models.
4. Insert a pointed tool in the hole near the end of cell strap (#141). Apply downward pressure and swing strap away from cell. Do **NOT** loosen any screws for this operation.



5. Invert movement and power cell will fall out.
6. Inspect for foreign material in cell compartment or on underside of cell strap. Wipe surface, as necessary, to assure good electrical contact. Do **NOT** scrape away red insulation on cell strap.
7. Check new power cell (Approximately 1.35 volts).
8. Insert power cell *with imprinted side facing down*.
9. Reposition cell strap into insulator No. 610. Swing strap into hold down post, applying downward pressure with a pointed tool in the hole near the end of the strap. Make sure the strap is **FULLY ENGAGED** into the hold down post.
10. Snap-back models: Remove movement from bezel, **PLACE IN CASE BACK**, pull crown to setting position, snap bezel and case together by applying pressure first on the 12 o'clock side and **THEN SNAP 6 O'CLOCK SIDE INTO PLACE**.
Water-resistant models: Retighten case back with a suitable case wrench, making sure case gasket is properly positioned.

MOVEMENT CHARACTERISTICS

Tuning Fork	— 17½ mm.
Frequency	— 440 Hz. (cycles per second). This is the tone of of "A".
Movement Dimensions	— Tonneau Shape — 7½ x 8½ ligne — 19.4 mm. (.763") long x 17.4 (.685") wide — 4 mm. thick without battery
Index Wheel	— Diameter 2.15 mm , 270 teeth
Electromagnetic Coils	— two, with approximately 8,100 turns of insulated copper wire on each.
Transistor	— Hybrid integrated circuit
Electrical Disconnect System	— When the stem is pulled out, the watch stops due to a unique electrical disconnect system, thereby, allowing for storage in this position. The same cell will operate the watch for a full year after this storage period.
Jewels	— 14
Accuracy	— Guaranteed to keep time within one minute per month.
Power Source	— A special mercury oxide power cell — approximately 1.35 volts. Identified as "ACCUTRON 221".

FEATURES

- This is the first American made Tuning Fork Watch to be marketed in Ladies Conventional Size Cases, Pendant Styles and Selected Mens Styles.
- There is but one caliber: Model 2210 — Equipped with hour and minute hand only. (As of printing date.)

SETTING INSTRUCTIONS

1. Pull crown "out".
2. Turn hands (either direction) until minute hand is slightly ahead of desired minute marker; then turn hand backward to this marker. Push crown "in" without turning.
3. **As with any lady's watch without a second hand, it is good practice to listen to make certain that the movement is running. If necessary, tap the case lightly at the "3" or "9" to start the tuning fork vibrating.**

SERVICING (See note)

- Series 221 has been designed for easy serviceability.
- The coil assemblies of the Series 221 may be removed without the necessity for disassembling any other part of the movement.
- Parts and technical information will be released to the jeweler at a future date.
- With the exception of power cell replacement and regulation, it will be required that all Model 2210 be returned to our New York Service Facility for repair until the early part of 1974. This will allow very close quality control.

Note: Some Important Reminders When returning Watch to Bulova for Service

Address package exactly like this:
Service Department
75-20 Astoria Boulevard
Jackson Heights, N.Y. 11370

Do **NOT** add the name Bulova Watch Co. to the address.

PRINTED IN U.S.A.

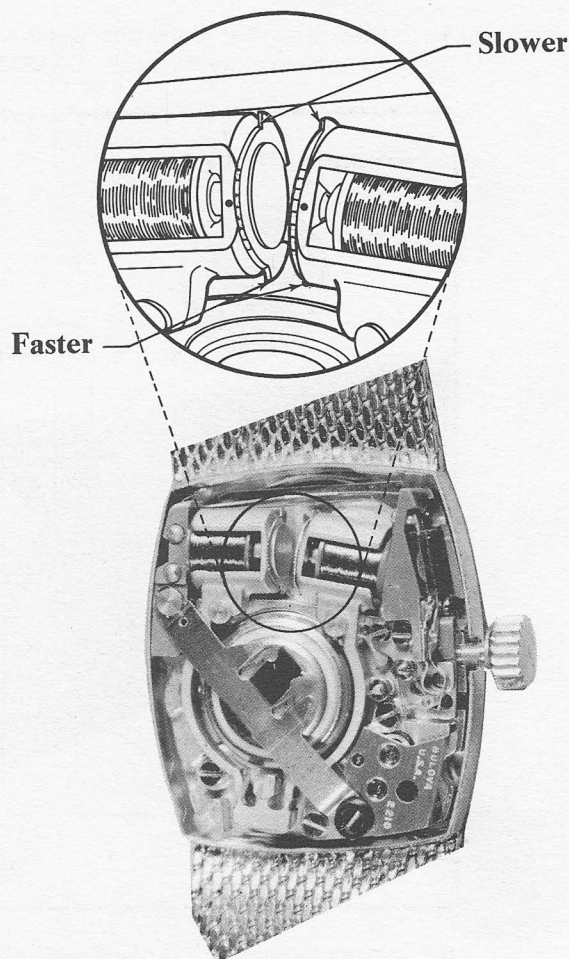
REGULATION

The 221 Accutron regulators are calibrated with eight divisions to provide for easy reference during regulation. Their appearance is similar to the 214/218 Series. Each division represents two seconds per day change in rate of the tuning fork.

To regulate two seconds per day *slower*, move either regulator one division away from the center of the movement. (See Illustration)

To regulate two seconds per day *faster*, move either regulator one division towards the center of the movement. (See Illustration)

Rotate the regulators with a pegwood stick, applying pressure on the "ears" of the regulators. If desired correction is more than four seconds a day, it is recommended that both regulators be moved equal amounts.



Maximum regulation is 32 seconds per 24 hours.

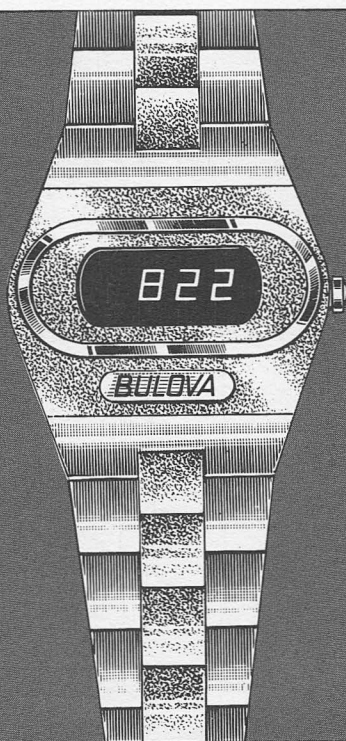
The Series 221 Accutron is factory regulated in the dial-up position to plus (+) 2 seconds per day, and will produce a double trace line on a Vibrograf B-200A using beat selector 19,800, and a double trace line using beat selector 19,800 on a Vibrograf B-100A.

- Insure package. If possible, send by registered mail.
- Do **NOT** send watch in its display box. Box cannot be returned.

BULOVA ACCUQUARTZ[®] DIGITAL WATCH SERIES 228 (Light Emitting Diode — L.E.D.)

MOVEMENT CHARACTERISTICS

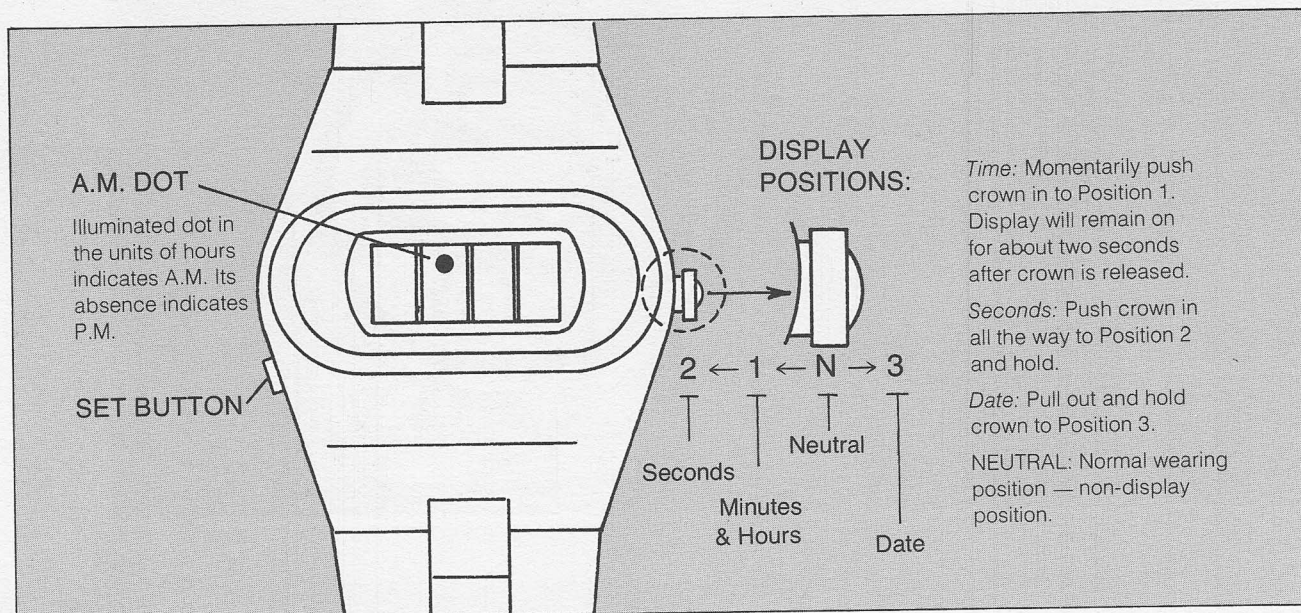
Quartz Frequency:	786,432 Hz. (cycles per second)
Movement Dimensions:	13 Ligne Diameter: 29.34 mm. (1-1/8") Height: 7.98 mm. excluding battery contact strap (5/16")
Elements:	Over 1,500 transistors contained in a C-MOS IC chip, (Complementary-Metal Oxide Silicon Integrated Circuit) plus: 2 Bi-Polar Display Drivers, plus: 1 Quartz Crystal
Power Source:	Two Silver Oxide Power Cells — "Bulova 228" Each rated at approximately 1.5 volts
Accuracy:	Laboratory tested to one minute a year
Guarantee:	One year, excluding power cells



FEATURES

- Single Display Button Activation: A single button controls the display of the seconds, minutes, hours and date.
- "A.M. Dot": A dot appears on the display to differentiate between A.M. and P.M.
- Date Feature: Display includes date display.
- Shock Resistant — Meets FTC requirements.
- Anti-Magnetic — Meets FTC requirements.
- Water Resistant — Dependent upon case employed.

SETTING INSTRUCTIONS



Setting Sequence

The sequence for setting the Accuquartz watch must be followed in the proper order. First set the exact *Minutes*, then the *Hour*, then the *Date*. The procedure is not difficult but please read all the way through at least the directions for setting the minutes before beginning.

1. MINUTES

- Push crown in to Position 1; display time and hold crown. If no display is shown, press then release the set button.
- Continue to depress crown in Position 1 to display minutes and hours. Wait until the time standard you are using as the reference to which you are setting the Accuquartz watch reaches the 60th second marker. At that moment depress the set button and hold both it and the crown (crown in Position 1).
- Minutes will advance at the rate of one per second. When proper minute is reached, release set button, then crown.

NOTE: When the set button is pressed for the minute adjustment, the seconds reset to zero and begin counting and you have, therefore, synchronized the seconds. If you interrupt the seconds counting by releasing the set button prematurely, start the process over again, commencing at the next 60th second marker.

EXAMPLE: If you want to set your watch to exactly 5:15, start advancing the minutes exactly on the 60th second marker of the time by which you are setting the Accuquartz. When the minutes read "15", let go of the set button. The seconds will now be synchronized to the exact time standard along with the minutes. Then proceed to set the hour as follows:

2. HOUR

- Do not push crown.
- Push and hold set button *only*.
- Hours will advance at the rate of one per second. When proper hour is shown, release set button.

NOTE:

To check for a.m. or p.m. pull crown to Position 3, to make sure that the illuminated dot appears in the proper twelve-hour period, otherwise the date will change at noon instead of midnight. When on, it indicates a.m. Its absence indicates p.m. If time of day is after 12 noon, advance hours until illuminated dot disappears.

3. DATE

- Pull out and hold crown.
- Push and hold set button.
- Date advances at the rate of one per second. When proper date is shown, release set button.
- On the first day of each month, following a month with less than 31 days, advance the date by following steps (a) and (b) under "Date".

IMPORTANT NOTE: Displaying seconds by pressing the crown in all the way and pressing the set button at the same time may cause the unit to stop or reset to zero. No damage has been done to the movement but the watch is no longer displaying correct time. Reset watch in accordance with instructions.



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Technical Letter

SUBJECT: REMOVING THE STEM FROM CALIBER PUW 5120

The stem must be in the "in" (running) position during removal to prevent the setting mechanism from disengaging.

Also, a screwdriver with a 1mm blade is to be used when depressing the stem release pin. Anything smaller may cause damage or disengage the setting mechanism.

If the stem is removed while it is in the "out" (setting) position, and the setting mechanism disengages, either of the two following procedures are recommended:

1- Holding the movement and a pointed tool in a horizontal position, carefully push the set lever into the "in" (running) position. Only a slight pressure is necessary to accomplish this fix. (See fig. 1).

2- Remove the hands and dial, and with a slight pressure, carefully push the set lever into the "in" (running) position. (See fig. 2).

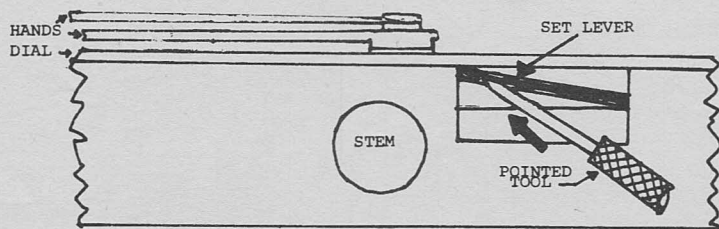


FIG. 1 SIDE VIEW

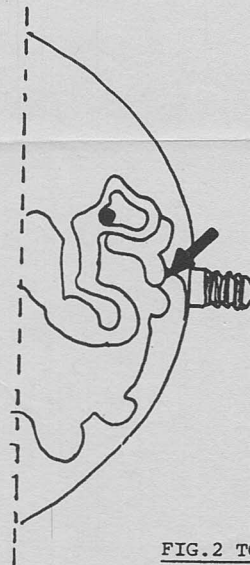


FIG. 2 TOP VIEW

Technical Letter

TIPS ON HOW TO SIZE 3 POPULAR WATCH BRACELETS

SHORTENING MESH BRACELETS WHICH USE A LOCKING JAW CLASP

Fig.1

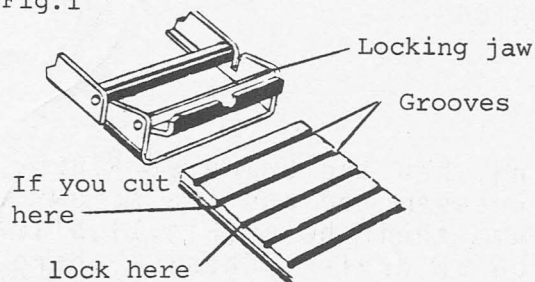
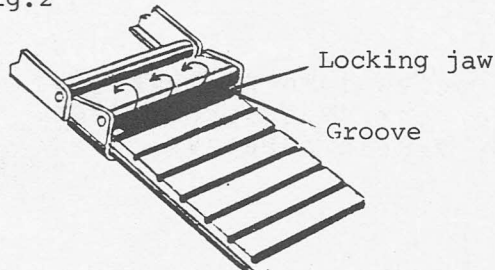


Fig.2



1. Open clasp and remove bracelet.(Fig.1)

IMPORTANT: Note the grooves on the underside of the bracelet.

2. With good bracelet cutting shears such as Bulova Clipper #101 shorten the mesh by cutting ON THE GROOVES.
(To center the buckle cut equal amounts from each end.)

3. Reinsert the cut end into the clasp.

4. BEFORE CLOSING THE CLASP,(Fig.2) BE SURE ITS LOCKING JAW WILL ENTER THE GROOVE IN THE MESH.

CAUTION:If the jaw does not enter the groove the clasp may be broken when it is closed.

5. Close the clasp securely.

ADJUSTING BRACELETS WHICH USE A SLIDING CLASP

NOTE: Location of notches may vary with style.

Fig.1

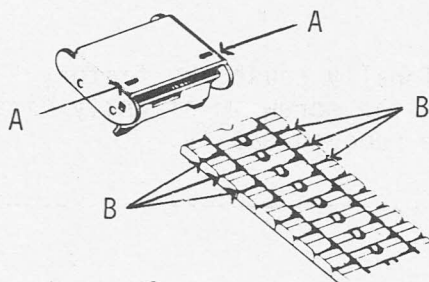
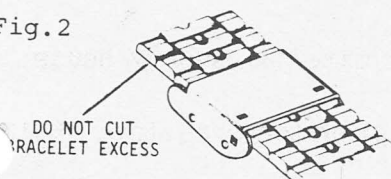


Fig.2



1. Open the lock on the sliding portion of the clasp.
2. Turn the bracelet over and note the notches on the clasp(A, Fig.1) and the corresponding notches on the underside of the bracelet.(B, Fig.1)
3. To adjust the bracelet, line up the notches on the clasp with the notches on the bracelet.(Fig.2)

CAUTION:If the notches on the clasp do not enter the notches on the bracelet the clasp may be damaged when it is closed.

4. Close the lock on the clasp securely.

DO NOT CUT BRACELET EXCESS

(OVER)

TECHNICAL INFORMATION SERVICES

BULOVA WATCH COMPANY, INC., 75-20 ASTORIA BLVD., JACKSON HEIGHTS, NEW YORK 11370 / (212) 565-4707

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ADJUSTING BRACELETS WITH REMOVEABLE LINKS HELD BY SCREWS

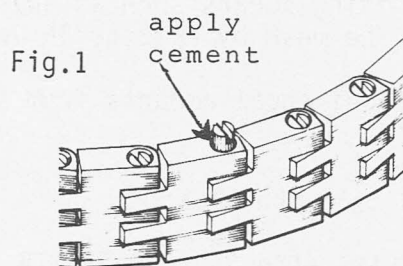
Many watches made today have bracelets with removeable links held by screws.

To prevent accidental loosening, these screws are factory sealed with an adhesive.

Therefore, once you have loosened* a bracelet screw you must reseal that screw into place.

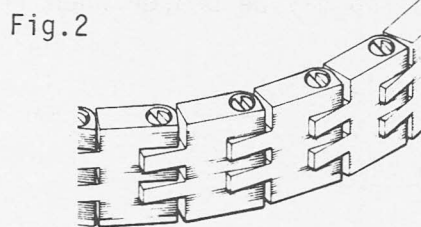
-----A LOST SCREW CAN MEAN A LOST WATCH-----

The procedure is simple:



1. After sizing, when the bracelet links have been reassembled and the screws inserted into their holes (Fig.1), place a drop of quick drying adhesive where the screw head meets the bracelet link.

2. Tighten the screw into place (Fig.2) using the correct size screwdriver. Wipe off any excess adhesive.



3. The adhesive will dry within minutes resulting in a neat, secure bracelet adjustment that will eliminate problems.

* If you have difficulty loosening a bracelet screw (occasionally caused by factory plating), use a proper fitting screwdriver and try turning the screw in slightly first. This will usually free a stubborn screw so that it can be removed easily.

RECOMMENDED ADHESIVES:

1. Aaron-alpha (crazy glue) cement. Available at your local watch material supply house.
2. Unbrako Adhesive- supplied with the Bulova Screw Assortment for watch bracelets #BS10

Technical Letter

(PART 1)

POWER CELL LISTING BY MODEL NUMBER

ACCUTRON-S.M.Q.-ELECTRIC BALANCE WHEEL MODELS

<u>MODEL</u>	<u>BULOVA CELL #</u>	<u>TYPE OF WATCH</u>	<u>INSTALL THE CELL WITH ENGRAVED SIDE</u>
1005	602	S.M.Q. Analog	Up
1105	606	S.M.Q. Analog	Up
2025	606	S.M.Q. Analog	Up
2035	606	S.M.Q. Analog	Up
2105	606	S.M.Q. Analog	Up
214 Series	214	Accutron Analog	Down
218 Series	218	Accutron Analog	Down
219 Series	218	Accutron Analog	Down
2210	221	Accutron Analog	Down
224 Series	218	Accuquartz Analog	Down
230 Series	218	Accutron Analog	Down
231 Series	218	Accutron Analog	Down
242 Series	242*	S.M.Q. Analog	Up
243 Series	247	S.M.Q. Analog	Down
2440	247	S.M.Q. Analog	Up
245 Series	247	S.M.Q. Analog	Down
246 Series	247	S.M.Q. Analog	Down
2470	247	S.M.Q. Analog	Down
2480	601	S.M.Q. Analog	Up
2500	602	S.M.Q. Analog	Up
2522.10	242	S.M.Q. Analog	Up
2562	317	S.M.Q. Analog	Up
262 Series	605	S.M.Q. Analog	Up
263 Series	317**	S.M.Q. Analog	Up
2640	601	S.M.Q. Electroset	Up
266 Series	247	S.M.Q. Analog	Up
268 Series	605†	S.M.Q. Analog	Up
2690	602	S.M.Q. Analog	Up
2772.10	242	S.M.Q. Analog	Up

*For Power Cell 604 use 242 cell.

**Cell #317 is used for 2633.10 in all watch cases except depthometer case 8459 in which #603 is used.

†Except for cases C4156 and C4229 which use cell #610. Caution: the incorrect cell # was stamped in some case backs.

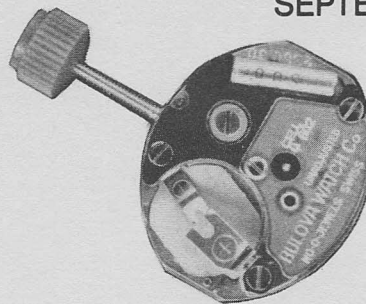
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SEPTEMBER 1982

Technical Letter



IMPORTANT NEW LUBRICATION FINDINGS ON SERIES 242; 245/246; 250

As a result of extensive field tests, we have revised our lubrication procedures for the above calibers.

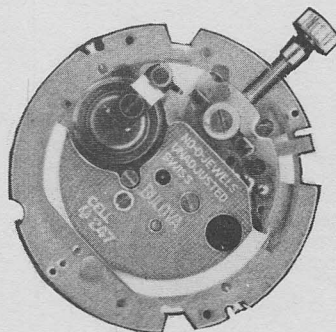
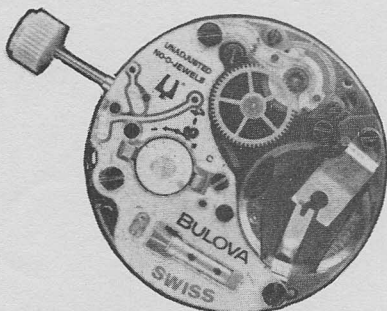
Please change your Service Manuals to now read:

Lubricate ALL upper and lower train wheel pivot holes and include the lower sweep second wheel bearing with -

Lubricant OL216 (Moebius - Synt-A-Lube 9010/2)

NOTE:

Caliber 242 Service Manual and Technical Revision Letter #42 should be changed to read as noted above. In addition, the cannon pinion/drive wheel junction, dial train posts and setting mechanism are to be lubricated with OL 206 (Moebius 8020/50).



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